Patent
Docket No: 50371US011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Andrew J. Ouderkirk et al.
Serial No.: 09/013,819
Filed: January 17, 1998
For: OPTICAL POLARIZER

Group Art Unit: 2872

Examiner: R. Shafer

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on:

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BRIEF ON APPEAL

Board of Patent Appeals and Interferences
Commissioner for Patents
Washington, DC 20231

This is an appeal from the Office Action mailed on August 28, 2001 finally rejecting claims 1-9, 13, 14, and 48.

This Brief is being filed in triplicate. The fee required under 37 CFR §1.17(c) for the appeal should be charged to Deposit Account No. 13-3723.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest is Minnesota Mining and Manufacturing of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1-9, 13, 14, and 48 are pending in the application. Claims 1-9, 13, 14, and 48 stand finally -rejected and are being appealed.

STATUS OF AMENDMENTS

The following claim amendments have been entered: (1) amendment submitted July 22, 1999, with respect to claims 1, 3, 5, and 14; (2) amendment submitted June 20, 2000, with respect to claim 13; and (3) amendment submitted September 26, 2000, with respect to claim 48. Claims 4 and 6-9 have not been amended since the original filing. An amendment to claim 2 to correct the obvious dependency error is submitted concurrently herewith. The claims as amended (including the proposed amendment to claim 2) are reproduced in Appendix A.

SUMMARY OF THE INVENTION

The present invention is drawn to an optical polarizer that includes in combination both a reflective polarizing component and an absorbing polarizer component.

ISSUES ON APPEAL

There are four issues to be considered, namely:

Issue I Whether the Examiner was incorrect in rejecting claims 1, 8, 9, 14, and 48 under 35 U.S.C. § 102 as being anticipated by Kondo et al. ('526);

Issue II Whether the Examiner was incorrect in rejecting claim 2 under 35 U.S.C. § 102 as being anticipated by Kondo et al. ('526);

Issue III Whether the Examiner was incorrect in rejecting claims 1, 5, 7, and 48 under 35 U.S.C. § 103 as being obvious over Matsumoto ('626) in view of Schrenk et al. ('949); and

Issue IV Whether the Examiner was incorrect in rejecting claim 13 under 35 U.S.C. § 103 as being obvious over Kondo ('526).

GROUPING OF CLAIMS

For the purposes of this appeal the claims are grouped as follows: Claims 1, 3-9, 14, and 48 (Group 1); claim 2 (Group 2); and claim 13 (Group 3). Each Group stands or falls separately.

ARGUMENTS OF APPELLANTS

The claims of the various Groups are treated separately for the purposes of this appeal. Although the claims in Groups 2 and 3 depend from claims in Group 1, they present further claim elements that are different and distinct. These distinctions will be evident from the discussion that follows.

Issue I

The present invention is directed to an optical polarizer. The optical polarizer includes a reflective polarizer that operates to substantially reflect light of a first polarization state and transmit light of a second polarization state. An absorbing polarizer is disposed in close proximity to the reflective polarizer. In this regard, the claims in Group 1 recite a "reflective polarizer" that "substantially reflect[s] light having the first polarization state" and "substantially transmit[s] light having the second polarization state." (See e.g., claim 48)

The Kondo reference does not teach a reflective polarizer as claimed in the present application. Element 7 of the Kondo reference, which was cited by the Examiner as teaching the reflective polarizer, is not a reflective polarizer. Rather element 7 operates to convert two polarization states to the same polarization state while the light is transmitted through the element. More particularly, one polarization state (depicted as p-pol) is waveguided through a birefringent medium I and exits element 7 on the opposite side. A second polarization state (depicted as s-pol light) also transmits through element 7 and is converted from the second polarization state (s-pol) to the first polarization state (p-pol) by the optically active Medium II. All light is transmitted through the element. This type of element is commonly referred to as a polarization converter. Hence, contrary to the Examiner's assertion, Kondo does not teach an element that substantially reflects light having the first polarization state as claimed by applicants.

For the above reason, the rejection under Section 102 that Kondo anticipates the claims of Group 1 cannot be maintained and should be overturned.

Issue II

Claim 2 (Group 2) also stands rejected by the Examiner as being anticipated by Kondo. Claim 2 recites that the "absorbing polarizer is formed integral with the polymeric reflective polarizer." This claim is directed to those embodiments of the present invention where the reflective polarizer and the absorbing polarizer are made as part of the same process. For example, the absorbing polarizer may be made by incorporating dichroic dyestuff into one or more layers or skins of a multilayer reflective polarizer or by coating a polyvinyl alcohol onto a

surface of the reflective polarizer prior to orientation. In this manner, the reflective polarizer and the absorbing polarizer can be concurrently formed.

In Kondo, a dichromatic polarizing plate 13 is laminated to the "polarization converter" element 7 described above. Even if element 7 were considered a reflective polarizer, there is no teaching that element 13 could be "formed integral" with element 7. Therefore, the rejection under Section 102 that Kondo anticipates the claim 2 (Group 2) cannot be maintained and should be overturned.

Issue III

Claims 1, 5, 7, and 48 (Group 3) are rejected in the Final Office Action as being obvious from the combination of the Matsumoto (JP '626) and Schrenk et al. ('949) references. The claims in this Group recite that the absorbing polarizer is "disposed in close proximity" to the reflective polarizer "to directly receive light" that is not reflected by the reflective polarizer.

The Office Action states that the Matsumoto reference teaches all of the claim elements "except for explicitly stating that the reflective polarizer includes first and second polymeric materials wherein at least one of the first and second materials is birefringent." The Examiner is incorrect in this characterization of Matsumoto. The absorbing polarizer 9 described in the Matsumoto reference is provided on the opposite side of a liquid crystal display from the wire grid polarizer described therein. Even if it were proper to substitute the reflective polarizer of the Schrenk reference for the wire grid polarizer of Matsumoto, the claimed elements would still not be found in the combination. The liquid crystal cell (3, 4, 5, and 6) of Matsumoto selectively alters polarization states of some of the light transmitted through the wire grid. The absorbing polarizer acts on this selectively altered light to produce an image. Such a construction does not teach or suggest an absorbing polarizer disposed in close proximity to the reflective polarizer to directly receive light not reflected by the reflective polarizer. The presently claimed invention is drawn to a combination of elements that work together. The wire grid and absorbing polarizer perform distinct functions and do not satisfy the claimed structure.

For the above reasons, the rejection under Section 103 that Matsumoto and Schrenk can be combined to render claims 1, 5, 7, and 48 (Group 3) obvious cannot be maintained and should be overturned.

Issue IV

Claim 13 is rejected under Section 103 as being obvious over the teachings of Kondo. Claim 13 depends from claim 1 and recites that "the absorbing polarizer is positioned to provide antireflection on at least one side of the reflective polarizer." This construction has

particular advantages, for example, in direct view LCD displays. As described in the present specification, the reflective polarizer can be used in such displays to increase the display brightness by reflecting light off of one side of the reflective polarizer. At the same time, the viewing side of the reflective polarizer element does not reflect light and degrade display performance.

Kondo does not teach or suggest the combination of a reflective polarizer and an absorbing polarizer when the absorbing polarizer is used to provide antireflection on one side of the reflective polarizer. As noted above, element 7 of Kondo is not a reflective polarizer and does not reflect light. Thus light incident on element 7 is transmitted though the element (while converting one polarization state to the other). Accordingly, there is no need for antireflection in the context of claim 13.

There is no teaching or suggestion in Kondo of providing antireflection on one side of a reflective polarizer to produce an optical polarizer that reflects light from one side and not the other. Accordingly, the rejection under Section 103 that Kondo renders claim 13 (Group 4) obvious cannot be maintained and should be overturned.

CONCLUSION

As noted above, each ground of rejection cannot be maintained and should be reversed. A favorable ruling is requested.

Respectfully submitted,

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APPENDIX A – Claims on Appeal

1. An optical polarizer, comprising:

a polymeric reflective polarizer including a first and second polymeric material, at least one of the first and second polymeric material being birefringent such that a refractive index difference between the first and second polymeric material for light having a first polarization state is large enough to substantially reflect the light having the first polarization state and a refractive index difference between the first and second polymeric material for light having a second polarization state is small enough to substantially transmit the light having the second polarization state; and

an absorbing polarizer disposed in close proximity to the polymeric reflective polarizer and aligned to substantially absorb light of the first polarization state and to substantially transmit light of the second polarization state, the absorbing polarizer directly receiving light which is not reflected by the polymeric reflective polarizer.

2. An optical polarizer as recited in Claim 1, wherein the absorbing polarizer is formed integral with the polymeric reflective polarizer.

3. An optical polarizer as recited in Claim 2, comprising a multilayer stack of alternating layers of the first and second polymeric material forming the reflective polarizer and a polymeric layer of material mixed with a dichroic dye forming the absorbing polarizer.

4. An optical polarizer as recited in Claim 3, wherein the layer forming the absorbing polarizer is coextruded with the polymeric material of the reflective polarizer.

5. An optical polarizer as recited in Claim 1, wherein the absorbing polarizer comprises a polymeric layer of material mixed with a dichroic dye.

6. An optical polarizer as recited in Claim 5, wherein the polymeric layer of material mixed with a dichroic dye is laminated to the reflective polarizer.

7. An optical polarizer as recited in Claim 5, wherein the polymeric layer of material mixed with a dichroic dye is coextruded with the first and second polymeric material of the reflective polarizer.

8. An optical polarizer as recited in Claim 1, wherein the absorbing polarizer is bonded to the polymeric reflective polarizer.

9. An optical polarizer as recited in Claim 8, wherein the absorbing polarizer is laminated to the polymeric reflective polarizer.

13. The optical polarizer of Claim 1, wherein the absorbing polarizer is positioned to provide antireflection on at least one side of the reflective polarizer.

14. The optical polarizer of Claim 1, wherein the absorbing polarizer is bonded to the reflective polarizer.

48. An optical polarizer, comprising:

a reflective polarizer including a first and second material, at least one of the first and second materials being birefringent such that a refractive index difference between the first and second material for light having a first polarization state is large enough to substantially reflect the light having the first polarization state and a refractive index difference between the first and second materials for light having a second polarization state is small enough to substantially transmit the light having the second polarization state; and

an absorbing polarizer disposed in close proximity to the reflective polarizer to directly receive light not reflected by the reflective polarizer, the absorbing polarizer absorbing light of the first polarization state to a greater extent than light of the second polarization state.